# OCCASIONAL NOTES ON PLANTS INDIGENOUS IN THE IMMEDIATE NEIGHBOURHOOD OF SYDNEY.

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The plant forming the subject of this paper is *Lyonsia reticulata*. It belongs to the order *Apocyneæ*. The order is not very largely represented in Australia; affording but fourteen genera in all the Australian Colonies; and the genus *Lyonsia* but ten species; five of which are found in N. S. Wales. Two of these, *L. reticulata* and *L. lilacina*, in the County of Cumberland. *Lyonsia reticulata* appears to me to be somewhat rare, or at all events not plentiful. Of course the experience of other botanists may be different to my own. I have however, for the last two years, made a very diligent search for it, not only within six or seven miles of Sydney, but also in the country about Parramatta. Yet I have found but one plant, and that within a mile of Sydney. Fortunately I have been able to obtain a good supply of flowers for study from that plant. Dr. Woolls has since kindly informed me of one or two other localities where it may be found. If I am correct in my supposition that the plant is comparatively rare, it confirms my previous experience, and what I suppose is the experience of others, that as a rule, self-fertilised plants are so. Darwin points to this probability, both in his "Fertilization of Orchids," and his "Effects of Cross-fertilisation in the Vegetable Kingdom." In the first mentioned work he says, "Whether any species which is now never cross-fertilised, will be able to resist the evil effects of long continued self-fertilisation, so as to survive for as long an average period as the other species of the same genera which are habitually cross-fertilised, cannot of course be told." *Lyonsia reticulata* is a strong climber, and appears, where it is found, to attach itself to

almost any forest tree; ascending to a height of forty-feet or more; and although the single plant that I have found near Sydney has attached itself to a comparatively low shrub, *Lambertia formosa*, it can be seen by its many convolutions that it is of great length. It bears small white flowers in panicles. The calyx monosepalous, its five lobes densely pubescent, the tube thick, and adnate by its lower portion with the ovary. Corolla monopetalous, its lobes somewhat longer than the tube, very much reflexed and densely pubescent. Stamens five, attached to the tube of the corolla. Anthers sagittate. Disk of five very distinct lobes or teeth. Ovary two-celled, divided by a thin septum, upon each side of which a peltate placenta bears the ovules.

The flower is in all respects a very curious and interesting one. The style and stigma, when freed from the closely lying anthers, have the appearance of having been turned in a lathe, or moulded in an ornamental manner. The stamens starting from the corolla tube, cross at once to the base of the style, then forming a ring round it, ascend, till the five large anthers lie closely together on the inclined surface of the stigma. The anthers are very long, being produced both above and below the pollen cells; and lying so closely round and upon the stigma, form a compact conical roof, with the base or eaves spreading out below so far from the stigma, as to quite protect it and the pollen from rain and dew. In fact, they adhere so closely to it, that it is a very difficult matter to separate them without tearing them. Botanically described, the anthers form an exserted cone; but I think I may convey a better idea of their appearance, by saying that they are like a half-opened umbrella, the style forming the handle, and the filaments and anthers the ribs and covering.

I have examined a great many flowers of this plant, in different stages as regards maturity; but have not met with an instance in which the anthers had separated, so as to expose the stigma, until after fertilisation had been effected. The pollen cells are of course inside the cone, and rest on the surface of the stigma. In every instance, in fully opened flowers, I have found the stigma mature and viscid and covered with pollen from its own anthers, the pollen

however not being in great abundance. As this careful protection of the pollen and stigma exists until the flower has withered, I can only arrive at the conclusion that the plant is closely self-fertilised. While however I say this, I wish to repeat, that I have only had the opportunity of examining the flowers of a single plant. There is therefore just a possibility of plants existing which at some stage or other open their flowers and thus expose them to cross-fertilisation. Bentham however mentions the exserted cone of anthers as common to the whole genus.

It is impossible to examine the flowers of different plants, without being struck with the difference in their various pollens. In some cases the grains are powdery, loose and dry, and liable, one would think, to absorb moisture readily. In others waxy and more likely to repel it. I am strongly impressed with the idea, that in cases where the anthers and pollen are so carefully shielded, as in *Lyonsia*, there is another purpose to be served than the self-fertilisation of the plant. There are so many plants known to be cross-fertilised, and yet which have their anthers very carefully shielded ; that the conviction is forced upon one, that the primary intention is to preserve the pollen from injury by rain or dew, in cases where it is absorbent and likely to be injured. In the case before us, *Lyonsia reticulata*, as I have already said, the backs of the anthers form so complete and compact a roof to the pollen-cells, that it would seem impossible even for a heavy shower to injure the pollen. In the genus *Cryptandra*, and especially in *C. amara*, the very small petals are hood-shaped, completely covering the anthers, until after the pollen is ripe ; while it is quite possible for small insects to obtain access to it from below. There are too, hundreds of cases in which at might, when dew is likely to fall, flowers not only close, but droop ; thus inverting the corolla, and making a roof of it to protect the anthers and pollen.

Acting on the supposition that the intention is to protect the pollen of those plants which would be injured by moisture ; I selected that of three plants, *Lyonsia reticulata*, *Cryptandra amara*

and *Correa speciosa*, in order to notice the comparative effect of moisture on their pollen. In the first two the anthers and pollen are protected, in the last they are fully exposed. I placed each kind of pollen in a watch-glass, in a dry place, till I supposed that as nearly as possible they were equally free from moisture ; and then sprinkled them lightly upon the surfaces of three basins of water. That of *Lyonsia* became saturated and sank level with the water in a few minutes. That of *Cryptandra* in two hours. That of *Correa* remained floating upon the surface till the following day as though a film of air intervened between it and the water. The effect upon pollen, becoming saturated so readily as that of *Lyonsia*, would no doubt, especially under a warm sun, be to cause it to swell and burst in an irregular manner, in place of emitting pollen-tubes in the usual way ; and this would destroy its fertilising power, for it is essential to the conveyance of the particles of fovillæ to the ovule, that the pollen grains be kept intact ; so that it shall escape by means of the pollen-tubes only. In an experiment with fresh pollen taken from the same three plants, the result was the same, with the exception, that the time required for the saturation of the pollen of *Lyonsia* and *Cryptandra* was longer, but still in the same order as in the previous trial.

I must say, that as these experiments were made under some difficulty, and in rather a rough way, I do not consider them conclusive, I merely mention them as a suggestion to any one who may be inclined to carry them out in a more perfect way. It is however, my intention during the present summer to make many, more carefully, in the same direction.